MAIN CURRENTS IN MODERN THOUGHT

A monthly service that brings together contemporary data in all fields, as these issue from laboratories, studios, class-rooms, observatories and wherever man pursues the eternally intriguing and beautiful mysteries of Nature

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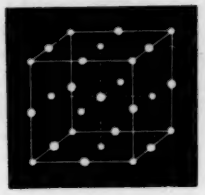


"Ah, but a man's reach should exceed his grasp, or what's a heaven for?"—BROWNING

TOWARD METRICS IN SOCIOLOGY

Editorial Summary

OUR SOURCE-READING for main currents in sociology and economics is guided by certain assumptions, which are best stated categorically and then exemplified:

1. Human society is an organism. Until such time, however, when it acquires a world-sensorium, it remains perforce an organism low in the organic scale. But it displays shadowy organic lines, nevertheless, which lend themselves well to metric treatment, as Kurt Lewin has suggested by his *life-space*; thus a metric—and we do not merely mean more statistics—is to be sought, which shall make sociology a measurement-science modelled somewhat upon the lines of the biometrics which to-day we see already taking shape in certain departments of biology.

2. These present years are part of a definite transition-period leading from a low-organic phase in the history of human society to a higher.

Considering the second proposition first, we observe that Russia's political thinkers have brought her a national unity of purpose which remains a force unshaken by any ill- or well-informed criticism we of other nations may direct against her for her pre-war policies. Whatever may be the source, and the eventual effect, of this political strength, it should be of concern to every intelligent person, for no such settled, conscious, determined purpose as Russia's (which gives her a clean break with the past) is evident in her allies. In all the English-speaking countries but perhaps New Zealand, the political confusion of thought about economics is notorious. The British Parliament struggles with a proposal to consolidate a social-relief patchwork by means of the Beveridge Plan, while the United States Congress balks attempts even at social patching. We of the English-speaking world acknowledge that new forces have surprised society upon the introduction of technology and mass-production; but we have not yet come to the point of seeing that commensurately new and fundamental thinking must now attend them. There is evidence of a community of aspirations in Britain and the United States; but aspirations cannot do the work of a common conscious will actuated by economic principles nationally recognised. Only a vague hope stirs as yet in these peoples: that some particular British or American form of socio-economic adjustment will arise as if by some miracle.

The Conference on Science, Philosophy and Religion in Their Relation to The Democratic Way of Life, Inc., in 1940 promised much; but in 1941 it lost momentum and, after the session of 1942, failure to bring these disciplines together was frankly admitted. The Conference's third annual report has not yet been received. One may hope that this excellent project will yet find its direction; but thus far it has provided no encouraging leads to new social concepts.

In the first series of studies by the Reconstruction Committee of the National Foreign Trade Council, published under the chairmanship of Mr. Clark H. Minor, occur some penetrating observations by Mr. Eliot Wadsworth of the International Chamber of Commerce, referring to the many organisations studying post-war needs. (A year ago, 112 such organisations were listed by the Twentieth Century Fund.) "So much planning," observes Mr. Wadsworth, "may sound a little chaotic; but who can say which of the many groups will throw some useful light on one or more of the factors to be dealt with? These factors are not all pure economics, nor subjectible to exact determination. Geography, politics, racial pride and prejudice, old hatreds and new, religions and ideologies, all have a place in the picture. . . . Nearly every committee assumes that a new and different economic structure, at home and abroad, will be built on the débris left by this war. . . . Planning opens endless fields of thought in which there can be no exclusive rights. Perhaps in place of planning, a better word would be research. . . ." In short, if we are to get down to true foundations for reconstruction, we require, right in the midst of the great industrial groups, and fostered by them, systematic studies of the meaning of our modern scientific concepts in social and economic terms, to bring intelligible order among the plans which proceed without reference to the intellectual revolution which is behind and within the technological (and hence economic) revolution of to-day.

Shall Russia, then, be alone to enter upon the work of peace fortified by an amalgam of science, art and philosophy?

Such an eventuality, to which at present we must bow, is intolerable for at least one good reason: Russia has achieved her unity by breaking with religion. If then Russia's internal solidarity gives her preëminence in the coming peace-settlement, we shall be confronted with an ideology impossible for us to accept as a basis for international relations. We of the so-called democracies shall have ourselves to blame for such a predicament. It means that, if we cannot overmatch the Marxian syn-

thesis by a fuller orchestration of all our cultural gains, including that of valid religion, we shall have failed our times. Is it reasonable to suppose that we could compete with Russia in stabilising the world abroad while at home we have no clearly established concepts to support a consistent economic, social and political doctrine of our own?

That we have grounds for hoping to document an ideology intrinsically superior to that originating in Marx rests upon the fact that since his death sixty years ago (March 14, 1883) certain thoroughly revolutionising events have virtually transfigured that material science upon which he sought to fasten his dialectic. Within four years of his passing, Michelson & Morley began their epoch-making experiments on the physical properties of light, and ten years later Thomson was to discover the "corpuscle", our electron. In 1905 Einstein was to begin the construction of a space-time idealism, with new-found constants such as the speed of light. By 1914 Moseley had provided that break away from Newtonian physics which led to wave-mechanics.

These scientific events are not less significant for political and social ideology than were those which they superseded and which served Marx and Engels.

Marxism was finally introduced into Russia by Lenin, and the Revolution formalised it (neo-Marxism). As Russia hardened herself to fight for her very life, so her philosophy, now wedded to state policy, tended to crystallise. These events were not unnatural: all nations in one way or another had a share in shaping their course. But their cost to Russia was a high one.

Just as Darwin's followers, helped by ecclesiastical intolerance, had organised Darwin's modest suggestions (which would have served religion well) into an anti-religious creed (neo-Darwinism), so, for its dialectical disregard of the valid element in religion, Marxian doctrine has paid a historic price: in spiritual coin. And although to-day even clerics of organised religion are once more participating in Russia's public life, her state philosophy has by no means acquired a pliability to what is valid in religion.

Under these circumstances, world leadership offers itself plainly to the thinkers of the English-speaking nations. Some of us, however, so afraid of truth that they dare not examine other men's points of view, insist in the face of certain facts that Soviet Russia's thinkers have contributed nothing material to sociology. MAIN CURRENTS addresses itself to, and is therefore source-read for, those who would generously see America's freedom spread broadcast over the world. Clearly our first task is to understand what is meant by materialistic dialectic before attempting to improve upon (e.g., by bringing up to date) that ideology which has so helped to consolidate and morally implement the Russian people that its army has won the admiration of all men and women candid enough to admire courage wheresoever it may be seen.

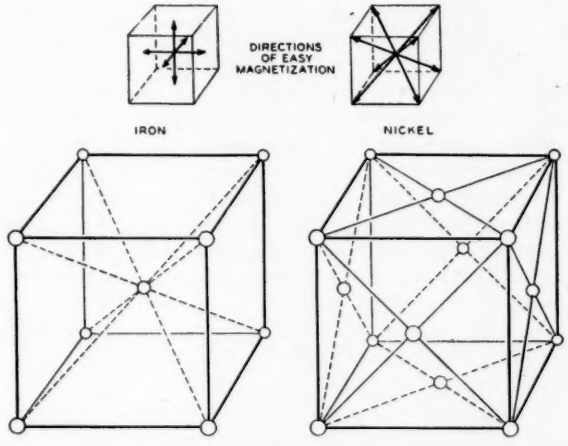
Dialectical materialism is a phrase which means essentially what the ancient Greeks meant by saying that Nature is reasonable, but with this limitation: the dialectic unfolds as a direct expression of the very properties of matter itself, automatically enforcing itself throughout all Nature (not excluding the domain of human conduct).

The doctrine, as Marx and Engels formulated and then left it, was built upon a few general ideas. Its main one was that the physical world is a unity: that physical phenomena are not separate from one another, but are parts of a whole: energy. From the continuity of the germ-plasm Marx took evolution as a fact not only of life but of matter itself. Indeed the kind of materialism that Marx understood had it that quantitative differences make qualitative differences, and that life might conceivably arise from, as a by-product of, matter. Another influential notion of his was that men are carried along in life only by calculable physical forces and that hence, in virtue of being in peculiarly close contact with such forces through his work, the physical worker is as near to knowing natural truth by working as the theorist is by theorising—nay, nearer to it, even if less vocal about it, than the theorist is. Marx reasoned further that, since it is physical laws that determine climates and thus condition soil, crops and livestock and finally govern human society, the course of events in human history is rather a function strictly of these laws than charged with and decided by human aspirations. J. B. S. Haldane (*Marxism and the Sciences*) does not interpret Marxism as having so great a materialistic emphasis as may be supposed from its framework. But at any rate whatever its shortcomings, dialectical materialism is a scientific, if dated, philosophy: of science as Marx knew it, with overtones of European philosophy (mostly Hegelian echo). There is no need to linger here over the semantic muddleheadedness of Marxist dialectic, for this has been well portrayed by Dr. Sidney Hook in his *Reason, Social Myths, and Democracy* (1940).

The 19th Century ended with the great generalisation, the principle of the conservation of energy, more firmly established than ever. This and other Newtonian statements of natural law still hold good, but the total social implications ascribed to them to-day are very different from those which Marx saw in them. By saying to-day, for example, that light can change into matter and vice versa we do not invalidate the principle of the conservation of mass: we merely have it in a new setting: the time-space continuum. We wonder what Marx would have done about sociology with Planck's quanta, with Heisenberg's indeterminacy or with the individuation field. What would he have done economically about Schrödinger's atom as "a hole with an aura around it"?

Finally, and this is a point of critical importance, we look also upon the principle of causality quite otherwise than the way in which Marx presented it. Perforce, so long as science was in its 19th Century stage, causality had to be taken, by scientists, as ultimately material. To-day we regard events as determined not only by the charge and velocity of atoms, but also by the properties of the space-time matrix. From this higher vantage-ground, physics can indeed be treated as statics. Thus a new and quite different kind of plan in Nature (*Planmässigheit*) finds good grounds for being to-day accepted as a fact. This is actually a kind of teleology; no longer, however, in its old guise as companion to theology, but instead divested of anthropomorphistic interpolations. However this may be, to the dialectical materialist, teleology to any degree is suspect.

A very simple illustration of the kind of teleology we have in mind will bring us to our first categorical assumption: that society is an organism. Familiar material structures such as rocks or metals consist of atoms spaced out at distances from each other very great in proportion to the atoms' diameters. The atomic constellation internal to common table salt appears in the diagram at the top of page 65; there the smaller sodium and the larger chlorine atoms are enormously exaggerated in size and shown as if solid. Really, they are each a minute complex electrical system rotating and revolving internally at prodigious speeds. In the crystal they stand off from one another in the rectangular system shown. Their relative distances apart are determined in part by their own electromagnetic character, in part also by the properties of space. It is not impossible, then, that what we call the properties of common salt are related to space-time properties.



The nickel and iron molecules: a simple illustration of the relation between matter and space. The atoms, highly complex electronic spins in quantum-orbits about a nucleus, stand off within their space-lattice, in a formation determined by their electromagnetic charges. But their arrangement is also governed by the properties of space-time. E.g., in the 3-dimensional space only 3 lines can pass through a given point at right angles to one another; hence the assembling of atoms in repeating symmetrical cells is governed both by the energies of the atoms and by the properties of space-time. Thus, observed properties or sensa (metal's hardness, magnetism, colour and so forth) are governed in part by space-time.

In unit crystals of iron and nickel, which, like those of sodium chloride, are cubes, the direction of easy magnetisation is a property determined by the spatial distribution of the atoms. Just as the (homogeneous) crystal-substance comes to rest (crystallises) in a static system such as is shown in the case of sodium chloride, so the crystal substance's internal moments of force, before crystallisation, can be regarded (and treated) statically from the point of view from which space-time is considered (as to-day it is considered to be) a homogeneous medium. If we could sit small like Alice in Wonderland inside a molecule of crystal table-salt while it is taking shape, we would see how all the atoms must come to hold certain specific places in the system, because the molecules' internal balance and harmony require that they should, by Goldschmidt's Law of Complication.

We may expect transformation of the materialistic dialectic into the dialectic of the new space-time idealism to take place by two clear consecutive stages: first, a valid biometrics will unite certain departments of biology such as morphology, taxonomy, œcology and symbiosis; then, pursuant to the first stage, a parallel development of psychometrics will base itself on studies (sociology) of man's form (morphology), of his racial relations (taxonomy), of his economic interrelations (œcology), and of his social interdependence (symbiosis). It is not that such innovations in anthropology are impossible; rather they want sustained attention. At present only a certain few of the scientific materials needed for a good sociology and mass-production economics are available.

But we are not without means of approach even so. In Indian philosophy we have a view of life which, like our physics, has also based itself on the concept of organic law (i.e., *ordo ab chao*). It, too, conceives the world as made of geometrical entities, namely points in space, each of which, in the Hindu realism (Nyaya-Vaisheshika), is called *Anu*, and in the Hindu transcendental realism (Purva & Uttara Mimamsas, or Vedanta) *Atman*, and is identified with human self-consciousness. Thus we have at hand a magnificent philosophical conspectus that is adequately scientific and yet puts its emphasis upon values, upon man. Unfortunately the Indian view of life is little known to the Western world. Even some Indians of the younger generation, reared in the atmosphere of Western science or in the anti-scientific political fever of recent times in India, scarcely know that their six darshanas (the above four, together with the Sankhya & Yoga couplet) agree upon nearly everything that matters for a good start in providing a world-view and are not in disagreement with modern physical sciences. For obvious reasons we shall not embark upon a discussion of this material here, available though it be.

A second instrument with which to detect, in society, Nature's pattern economies is, however, better at hand. There is an art of social and economic relationships: the drama. Drama, in a master's hand, is obviously as much a creation of intuitive insight into human relations, physical and mental and emotional, as music is an exercise of intuition in tonal relations. Music may be analysed or described by the same mathematical technique as that which may be used to analyse heat and electricity (MAIN CURRENTS, volume 3, page 17). So drama must logically yield a mathematical picture of human relationships. If this picture turns out to be symmetrical, we have something analogous to the space-time disposition of atoms in the crystal-picture. The point is that, if the existence of such structure can be detected through the medium of an art, there is some hope for Marxian materialistic dialectic to be elevated from its present lowly preoccupation with physical forces (and with psychical forces as mere outworkings of the physical); and the Marxian picture will be supplied with the missing link of values: that is, with the confidence that man, his fellow men and Nature participate in a great ideal process.

If *both* neo-Marxian dialectic and fragile hope-idealisms were made obsolete, the struggle between them would cease. This restoration of idealism to social philosophy would also be a neat Hegelian stroke of synthesis,

to which no Marxian could in principle object. If we do not face up to our own duty to create a socio-economic philosophical synthesis, then we shall see a struggle to the death between the forces which, by employing the evidences of wealth, still rule the democracies, and the forces embodied in the Russian State. Our only hope is to make them meet in higher common intellectual ground.

The detection of measurable relations between people in an art, the drama, is only a beginning, to be sure. In this spirit we turn to Shakespeare's Plays to inquire whether the physical and psychic tensions at work in them are subjectible to geometric estimation. What will a demonstration of such a geometry of psychic and physical tensions suggest?

If Shakespeare has held the mirror up to Nature in his Plays in the same sense as, and with the same intuitive insight with which, Beethoven outleaped the mathematician when he wrote a symphony, then it should follow that geometric forces are at work between people (in the space-time matrix). In other words, if the psychological, physical, moral and other exchanges among people submit to a technique of description analogous to that used for a crystal lattice system, then we must suppose that in the social realm some *ordering* forces are at work. Nothing more is implied, and we need not strain analogies.

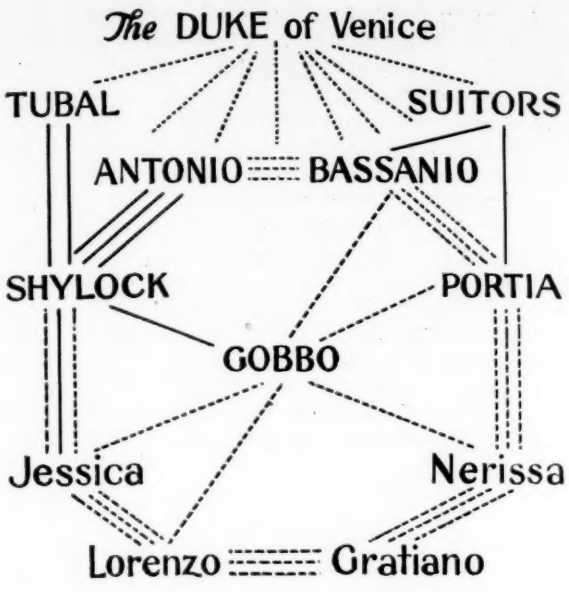
The question first is factual. Does a Shakespeare play upon scrutiny reveal the dynamism internal to human relations, that is, a balanced tension system, if all the factors are brought under survey: the characters' dwelling-place, their kin, their social status, educational resource, monies, motives, sense of beauty and humour, and any other factors we may adduce?

The Merchant of Venice deals with the personal equation of worldly possessions; it caricatures the Jew in a gentile community, contrasts legalism with justice, and romanticises love: it will serve us well.

The opening events lead directly into a pattern which turns out to be the only pattern that gives the cross-relations of the characters, as a causal structure in terms of their passionate psyche, virtuous soul, and physical circumstances. The picture is even tinged by a certain spiritual aloofness, suggested by the Poet's own elevation above the scene of events.

Bassanio is too poor to court Portia in due style. So he asks Antonio to lend him money. Antonio is willing, but his ships have not returned, and so he must seek to borrow money in his turn. Now the only man in a position to lend it to him is a man whom Antonio despises and who hates him. This is the plot situation, which determines the course of the action. They have sown: they shall reap.

All these four characters live at the same socio-economic level. Below them, in closely analogous relations to each other, move another four characters. As Jessica lives with Shylock, so Nerissa lives with Portia. Like Bassanio and Antonio, their two friends Lorenzo and Gratiano are close friends with each other; they live on a lower social level. These eventually get married to Jessica and Nerissa, women of dependent status. Above them all stands the Duke and below them all stands Launcelot Gobbo. Above the Duke stands Natural Law;



and, below Launcelot, his father, old Gobbo, resigns himself to the status of a quidnunc, who is not even shown in our diagram. To keep matters as simple as possible, Solanio and Solarino, and the three servants, are also omitted from the diagram, for inclusion of them would require the figure to be a three-dimensional polyhedron. The play must be closely read, that all the delicate nuances of the pattern may be seen in its full nicety.

Our flat diagram, however, suffices to display the equational relationships of the characters of the play. Portia's revulsion against the suitors heightens her inclination toward Bassanio to so much the greater fervour, just as Shylock is provided with Tubal, as a gossip, to make his hate for Antonio rise to fever heat. As Bassanio marries Portia, so Jessica marries Lorenzo, and Gratiano Nerissa—and so also Shylock is related to Antonio in hate, by the pound-of-flesh bond. On the right side of the diagram are the uniting forces which cause the domestic disintegration on the left. The sensitiveness of the Poet is best seen in the relations of Launcelot to the rest of the characters. He is portrayed close to Jessica and Lorenzo, to Bassanio and Portia, and he has a connection with Shylock and with Nerissa. But like his connection with Antonio, his appearance with Gratiano is negligible. That the Poet, who wrote no more from a diagram than Beethoven wrote from, let us say, a Laplace equation, should have drawn those two connections so slightly and in such nice parallel, is evidence enough of his intuition of Nature's inherent balances. And how deftly, too, the Suitors are equated, in their effect on Portia, to Tubal, in his effect on Shylock! We have here indeed a study in what the Indian thinkers call *karma*, the operation of a natural law such as that of the conservation of energy, but at the moral (social) level.

The play's pattern is that of a psychophysical system among a group of people, parallel to an animal œcological system and to some inorganic systems. Everything in the parallel depends upon whether one regards the

Poet's plays as artistically true cross-sections of life as life really is. It is also necessary to know whether a single pattern and only a single pattern, is derivable from each play uniquely, so that the parallel to any given individual crystal atomic system can be set up. Examination of *Lear*, the tragedy of ungoverned emotion, or of *Hamlet* (over-balanced mind), shows unique patterns. A beginning which the present writer has made upon *Othello*, the tragedy of sexuophysical imbalance, betrays another unique pattern. *As You Like It*, purely a romance, offers still another design. In general, it is observed that the earlier the play in time of writing, the simpler the design. *The Tempest* has the subtlest pattern of them all.

These pattern economies in human relations fit well into the increasingly clear knowledge we are gaining of pattern economy in Nature as a whole. In the world settlement ahead, vast historic forces (presumably also patterned) will come to play upon each other. Everyone knows that powers of state, of church, of scientific ideology, of private property, have been feeling for strangle-holds upon each other, commencing with 1914 and moving with accelerated violence through the bombing of Corfu, inflation in the twenties, Japanese aggression, the rape of Ethiopia, the disgraceful betrayal of mankind in Spain, and so forth. The military victory of the United Nations will settle only a very small part of our problems—certainly it will not solve, for example, the problem of the relation of science to religion, nor that of one religion to another, nor that of production to consumption.

World settlement involves reëducation of nations in various degrees of thoroughness. In the educational tasks which lie before us, the rôle of scientific, especially mathematical, philosophy is bound to be a prominent one; for mathematics is a very old and properly respected discipline: it is a public art and does not for long allow any mumbo-jumbo esotericism to poison it. Its reach into the secret recesses of Nature is nearly limitless and always fine. The Hindus and the Chinese prize it as much as we do: they were its discoverers. They will find world concepts based thereon congenial to their culture. But the mathematics we need for our future world unity must explain human relations. As yet the very idea that mathematics can be used to display such relations has scarcely been entertained; but already we have tried to show that a social metric may fairly base itself upon present knowledge.

From measurement in sociology, then, to the recognition that economics based upon united natural and moral law is the only valid economics is but a step. In this way we shall have brought Russian social thinking on to higher ground, where the old animosities about religion may fall away. The mathematical dialectic of transcendental realism, that harmony lies under the movement of atoms, can be no enemy to a harmonious world order, since it beautifully reveals that order, itself. And when world-wide confidence in an ideal order, in which man lives, moves and has his being, has been restored, world-wide unity will have been brought nearer to attainment. Such far sociologic and economic vistas, then, engage our editorial policy. F.K.

THE METRICS OF FREEDOM

A Report

THE FOLLOWING is a redaction of a discourse addressed on January 28 to the New Hampshire University Chapter of the American Association of University Professors at the invitation of its president, Dr. Charles W. Coulter, head of the University's Department of Social Science. The speaker, Mr. Norman Dodd, is Director of the Guild of American Economists, a New York group pursuing the basic studies which are required for the formation of a philosophy of sound economic and social relationships, supported by contemporary knowledge in all fields. The philosophical beauty of Mr. Dodd's central concept brings into relief the essential harmonic laws inherent in socio-economic order.

The theorem here expounded originated in an intense effort by representatives of the business, political and cultural worlds to digest their personal professional experiences in order to identify the forces challenging the institution of private property; and to discover why the American people, dedicated as they are to Freedom based on principles, should countenance any abandonment of those principles, and thus imperil the Freedom. These questions are directly related to one another.

The Declaration of Independence, which has established for us the tradition of democratic Freedom, holds us responsible for the maintenance of Freedom at home; and to-day the Atlantic Charter has committed us to extending this responsibility abroad. In the Declaration Freedom is conditioned wholly to observance of laws ordained by a supernal power, beyond personality; in the Charter, however, Freedom is presented as a relative state, to be determined by a majority interpretation of material circumstances. This shift, from an allegiance to natural law to reliance upon the opinion of a group of people, has proceeded side by side with a change in the prevailing varieties of ownership interests and has been accompanied by progressive retrenchments of civil liberties.

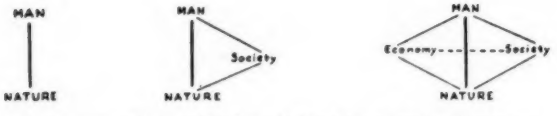
Studies originating in the historic transition thus briefly described lead to a discovery that there is a clear reciprocal action between economy techniques and social reactions, and this discovery prompted our group to return to first principles in order to determine how a society and its economy are related to each other in cause and effect, and whether this relationship lends itself to exact measurement: a metric sociology.

Since, in describing this equational relationship between social and economic forces, certain controversial terms will enter the argument, a few definitions will be of value.

By Freedom we shall mean that clearly defined condition of it in which neither man's need for a political government nor his dependency upon material goods provide means by which he can be dominated by any of his fellow beings. Natural law will refer to those demands of our environment to which we have the power to adapt

ourselves but which we are powerless to alter or nullify. It is perhaps needless to say that there is much of natural law which we have not yet discovered. Economy will mean the total results of the impact of man's action upon material nature; similarly, society will cover the total results of the impact of man's mutual reactions in terms of human nature. The modern mind finds it difficult to distinguish between these phases of human life. There are no strictly primitive societies in the world to-day, hence we observe fishing, house-building and other economic uses of the environment everywhere alongside purely social living which rests not upon the resources of Nature, but upon domestic, fraternal and other quasi-natural needs of man. It is, however, quite possible to picture a human society in which marriage, child-rearing, eating, simple arts such as singing and dancing, and various sports, could in a suitable climate constitute the whole of life, without need for economic exploitation of Nature. Since, in fact, economic and social developments proceed invariably together, they must have a common origin, acceptable as axiomatic, which hence is the point of departure required for a social metric.

That self-evident origin is in man's power of self-consciousness, a power of detachment which, exercised toward his fellow man, gives rise to human societies, in contrast with animal herds; exercised toward nature, it enables man to objectify his environment and thus to exploit it.

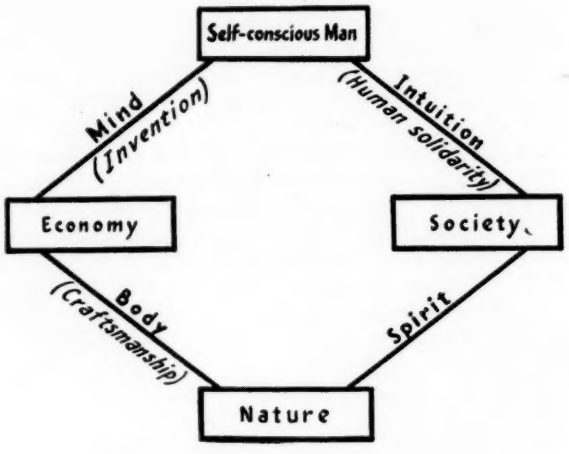


The axiomatic relations which form the base of an ordered social structure.

From this axiomatic beginning we move immediately to an inevitable postulate: on account of their common origin in human self-conscious power a society and its economy are really two parts of a single whole, and that is why their relationship to each other is ever mutually reactive. The conflict-relationship which exists between them to-day is not, however, one necessarily inherent in the nature of things, but rather is one due to a faulty direction of our own powers. Any attempt, then, to establish Freedom upon such assumption of natural conflict will prove vain. We have been trying to attain a goal universally recognised as right by building upon a foundation which we here can perceive to be unnatural.

The four major factors which concern us here, self-conscious man, nature, human society and its economy, are thus causally linked to each other. Since the argument itself depends upon these axioms, they will bear reïterating at this point: self-consciousness is man's distinctive mark whatever be the features he has in common with other living creatures. This power, by which we can stand off from nature, enables us to exploit her resources. The features peculiar to human society—the arts of human living, in contrast to passive herd existence—are likewise dependent upon consciously adjustable relations. Because of their common origin, society and economy may well be expected to display harmony as the only enduring interrelation.

From these axiomatic conditions certain new postulates can be adduced. For example, what two specific faculties in man, secondary to self-consciousness, allow him to exploit the resources of Nature and to establish a society? We notice at once that it is his self-conscious mental power, shown for example as invention, which is the instrument which man uses for his economy: in this direction his relationship to Nature is intellectual. In the other direction, however, that of society, we find that it is in greatest measure his affective power, shown as creativity and æsthetic discrimination, which is his instrument: in this direction his relationships are intuitional; his society involves responsibility: of marriage,



The same sociometric axioms, now with postulates.

for children, over an æsthetic milieu, to himself—he has, in a word, values. There is, of course, no real divorcement within man's nature, to be supposed from a bifurcation which insists both upon the quality of loving insight for society, and upon the quality of reason for economy. In other words, we cannot sanely conduct our social relations upon mathematical logic in disregard of soul, nor develop economic resources on a sentimental basis. We shall not here pursue this intriguing part of our subject beyond identifying the four-way linkage: physical, mental and intuitional resources, and finally those uttermost resources which bring him back full-round to his unity with Nature once more, by means of, in simple societies, animism, and in complex societies, spirituality.

From such a basis, any civilisation we attempt to establish develops through the medium of four supporting institutions, three of which, if they are to derive their characteristics from the corners upon which they rest, logically become production (Nature-conditioned), education (evocation of powers of consciousness) and government (ethical direction). The fourth institution, economic in character, remains, so far as the United States is concerned, yet to be devised. That this missing institution should be that of industrial management is inevitable—management, however, not in inherited

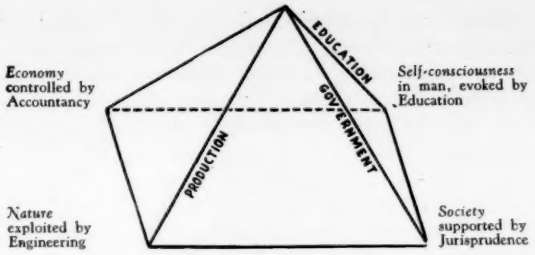


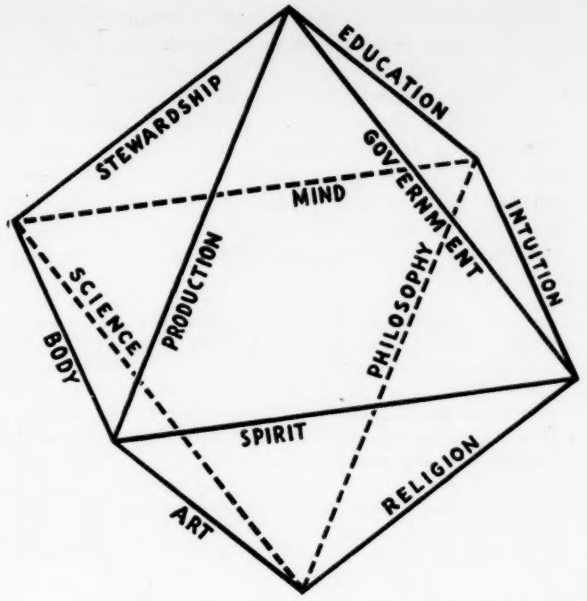
Diagram to show the four corners of a culture, from which arise appropriate supports for a peak of civilisation — with three supports named (education, government and production) and the fourth (unnamed) lacking in our society. See next illustration for the completed form.

forms; not as a function performed in a philosophical vacuum, divorced from social meanings; not an isolated skill employed for power and recklessly; but management, instead, as an acknowledged professional peer of education, legislation and production, demanding as much knowledge and responsibility as does any one of these other three. The profession of industrial management does not exist in this sense, and its absence obviously explains our failure to have developed a dependable foundation for maintaining Freedom, the capstone of our culture, to which we have so long dedicated our lives. The conditions of our times are so serious that this circumstance challenges us to develop an institution which takes care of goods and services at the point where responsibility for production leaves off.

If we are to retain Freedom, we are required to establish an institution through which Stewardship may find expression in the same manner as the institution of government once provided an opportunity for the practice of Statesmanship. But this challenge cannot be met unless an examination of our economic or management experiences will enable us to identify and accept principles in the same way in which our intense consideration of social experience long ago led us to identify and accept social principles which were used by us to form the background for our consciously designed institution of government.

Through what avenues can we look for the knowledge by which to judge such principles? Must we not provide a framework upon which to analyse our economic experience? Fortunately this needed framework has been and is being accumulated through the arts, science, philosophy and religion, and our own research has convinced us that the contribution of each of these major cultural disciplines is exactly appropriate to production, management, education and government respectively. In fact, the experience of the artist, the findings of the advanced scientist, the observations of the philosopher and the revelations of the religious prophet can not only be shown to give authority to these institutions, but can even be integrated into a single culture in specific support of the civilisation for which these institutions have come into being.

The regular octahedral pattern into which these elements fall—a pattern in which no element is given greater weight than any other—also designates the areas of influence of the particular professions and their appropriate applied sciences. Engineering and mechanics,



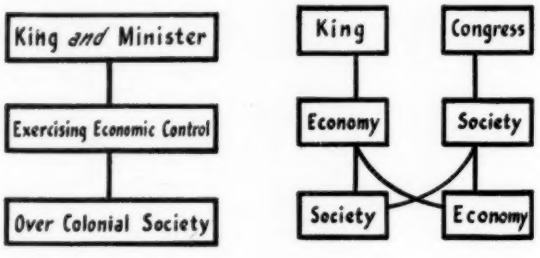
A design for a balanced social order, in which a civilisation is brought to a peak by education, government, production and stewardship, while each of these functions is kept in proportion by a deepening of experience through science, art, religion and philosophy.

teaching and metaphysics, jurisprudence and ethics, fall naturally each within the sphere of Nature, of deliberative Thought and of Society, where they are relied upon for the application of knowledge and the maintenance of standards. This centres our attention at once upon the absence of any profession responsible for the application of knowledge and the maintenance of standards of industrial management. It underscores a demand that economics be raised to the level of an applied science, and that a profession, responsible for the application of its principles, be brought into being.

There is no longer any reason to postpone an effort to fill this vacancy. Original studies by experienced industrial engineers, prompted by their efforts to determine the causes behind the high mortality rate of American business, recorded by W. L. Churchill in particular, show that such standards can be formulated. Once this vacancy is filled, an economic crime can be identified in the same manner as it has long been possible to determine crimes against society. Inasmuch as the findings of these advanced industrial engineers express themselves in figures taken from the operating or profit-&-loss statement of productive enterprise, and since accountancy is thoroughly accustomed to analysis of this type, a challenge to us to create an industrial management profession can be met.

In these same patterned terms history may also be analysed. Recent history of the United States then becomes the story of a gradual transition from a state of affairs in which society is dominated by its economy to a state in which economy is subordinated to the needs of society. It is, in short, a record of a replacement of one vertical relationship by its opposite. We have yet to place our society and our economy in the horizontal relationship demanded by the pattern on which the maintenance of Freedom must ultimately depend.

In simpler societies, the division between the social and economic aspects of man's life was hardly discernible: primitive man did not live in sharp consciousness of his separateness from the environment which nature provided. It is man's acquisition of knowledge and techniques which lead him to set himself off from nature, and it is from this point on that alternation of power between the economic and social aspects of his life begins; while man revolts against a tyranny of the few, only to succumb to a tyranny of the many, and so back and forth.

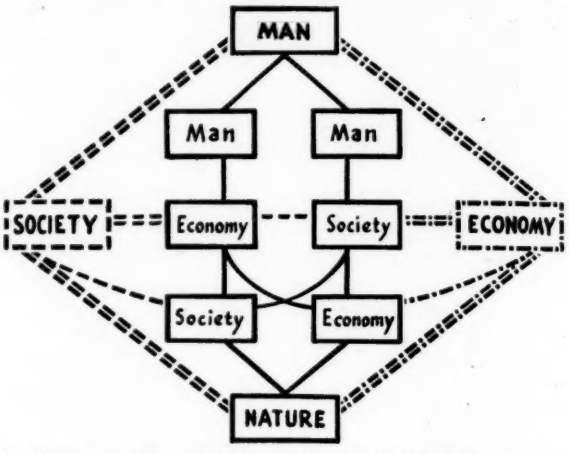


A. The vertical situation in American Colonial times.
B. The oscillation of power at the time of the American Revolution, achieving an equilibrium only temporary, since the oscillation resumed and passed through two periods of phase, roughly 1800-1860 and 1860-1920. A third swing has recently started.

In our own history, the tyranny of a distant, unrepresentative few, misusing economic power, led to the revolt of the Colonies and the forming of the Union (1776-1789). This far-reaching achievement became possible because the Unionists were actuated by a new idea of the relationship of human government to natural law. Thenceforth representative government was to operate under constitutional sanctions derived from natural and moral law as two aspects of a single law—"the laws of Nature and of Nature's God". But one gesture, political only, and no matter how radical, does not suffice to check the swing of economic and social forces. Slowly, till 1860 roughly, control of economy by an intensely active, socially conscious electorate increased. Then economic power, centered in a small group, asserted itself. To-day the swing is the other way.

Two simultaneous courses of institutional action, however, exist which, if taken, will put an end to this see-saw: the creation of a management-profession based on a valid philosophy of culture in contemporary terms; and the concurrent development of the educational institutions which will raise man's cultural level to new heights —to a real meaning of "a higher standard of living"—for attainment of which, technical materials and social securities should be subordinated as means.

We have demonstrated the nature of the challenge of our times by means of a diagram. There we perceive how we need to adjust our economic techniques in order to discharge our responsibilities to ourselves and to all mankind. We have shown that the natural consequence of meeting this challenge would be a harmony and reciprocity between society and its economy from which man could rise to that higher level to which his accomplishments in other fields have already entitled him. Thus we return, through a diagrammatic summary of historic experience, to the four-cornered base of our original pattern from which we first drew the conclusion that the attainment of Freedom depended directly upon our establishment of social and economic balance by means of economic adjustment deriving its authority from natural law.



The ideal balance relation of the future, to be achieved by holding fast to present socialised gains in order to prevent a fascist reaction, but swinging economic concepts and practices level to social needs.

In fact, a study of the balance relationships which characterise this original pattern will reveal the need for uniform qualities behind our institutional, professional and cultural activities. For example, a devotion to natural law within the social sphere—"the laws of Nature and of Nature's God"—requires a comparable devotion to natural law within the economic sphere. Similarly, the modern disclosure that Nature never fails to express herself in patterns demands that we accustom ourselves to thinking in patterns: a recognition of the vital importance of ratios and relations. Indeed, the very term "rational thinking" implies ratio, balance, proportion, pattern.

If we use the background of pattern equationally, a brief review of the social, economic, professional and cultural events in the history of our own institutions permits us some interesting and significant conclusions, of which we give one:

Nowhere in the octahedral pattern is provision made for such an institution as the financial world. Yet until 1929 we became increasingly dependent upon this institution, and, as a result, adopted the tactic of making money (on the stock-exchange) first and of producing afterward. Even a cursory review of American history reveals the influence of the financial world on our basic institutions of education, government and church, and discloses the extension of its controls through management and of property-rights. Such unbalancement of the independent institutional, cultural and professional relationships fundamental to the cause of Freedom would naturally be followed by efforts on the part of society to restore balance. One such counter-stroke has been the development of labour as an institution. Organised labour has been accepted as a part of the American scene and so also we have come to accept the efforts of labour to gain control of production through industrial

personnel. This is a sufficient instance of the equational nature of our design.

One disturbance of the pattern-balance effects another. When we swing from finance-control to labour-control. we must expect to see new attempts to create balance by artificial means. The growth of government-agencies which operate outside the bounds of our legalised framework speaks for itself, not to mention their efforts to control and influence production, education, government and management.

Taken together, these instances are but one example of contests for control, documentary of the importance of balance and the serious consequences of violating balance. These obvious facts surely impel us to seek principles instead of endlessly developing institutions whose avowed purpose is but to exercise control over puppet institutions. That we acquiesce in such extension of controls by governmental bureaus and that we are willing so—and with no better reason—to curtail our Freedom is due, surely, to our ignorance of the possibilities of pattern and balance in national life.

The relation of civil liberty on the social side to privacy of property on the economic side provides another such instance, if one be needed. It may be recalled that civil liberty was safeguarded legally by placing the burden of proof of guilt upon the government in the case of a crime against society; and the privacy of property was safeguarded by legalising its condemnation but outlawing its confiscation. Both of these safeguards still stand as part of our fundamental law, but historically and in practice to-day the privacy of property has been invaded by means of an interpretation of the 16th Amendment through the inclusion of profits as income for purposes of taxation (capital-gains tax). If the dynamic relationships of our pattern are true, we should expect this invasion of one basic economic policy to be followed by a violation equally fundamental, now in social life. It is of interest to note that in all cases involving the infraction of tax-statutes the burden of proof of guilt has been shifted from government to the individual citizen.

Since each limitation of Freedom to which we have given in has been condoned on economic grounds, we must conclude that it is our refusal to alter our economic practice to accord with the principles of natural law which has led to present-day retrenchments of our Freedom.

If then we are to regain that quality of Freedom to which we were originally dedicated—a Freedom based upon the inalienable cultural rights with which all men are equally endowed by their Creator—we must abandon not the principles which have differentiated this country from others, but abandon the practices which have caused this country to be classed with them. We must recognize that Freedom demands a correspondency between social policy and economic practice—a correspondency which acknowledges the sanctity of natural law as clearly as our allegiance to the ideal of Freedom itself does.

Finally there is not an hour to lose in uniting our effort to find the economic counterpart of those natural laws which underlie our political heritage. Already preliminary studies of our own have identified such a counterpart; remains now to overcome resistance to the idea that our observance of natural law can be continued beyond the physical and biological sciences into the sphere of human and economic relations. This idea invalidates any notion we might be tempted to entertain of the efficacy of artificial control. It is vital to the Freedom which we believe to be our inalienable right at home, no less than indispensable to our spreading of that Freedom abroad.

FUNCTIONAL PRICING

Accountancy as a Science

In these days of OPA measures, ceiling prices, commodity shortages and rationing, everyone in the United States, from the Government to the latest baby, is affected by price regulations. The Government is the largest single purchaser of products, supplies and services: the baby is a consumer of safety-pins, fruit-juices, diapers, blankets, milk and talcum-powder. People are more greatly concerned with prices to-day than they have ever been before in the history of our economic scheme; for, in it, all such products, in order to be bought, must be paid for with money. It is no wonder, therefore, that the public is bewildered by to-day's continuous rise of prices, for it has no definite standard of price-measurement by which to determine whether in exchange for its money it is receiving due value in goods.

This very question of rationalising pricing-systems has been brought forward afresh by Mr. T. C. McCobb, comptroller of the Standard Oil Company of New York. Last December, at a meeting of the members of the Comptrollers' Institute of America, of which he is president, Mr. McCobb urgently requested that a standard system of cost-accounting be generally adopted, not only for internal convenience, but particularly because many of the existing cost-accounting systems did not in effect serve the public weal. His telling point was that both a recent re-negotiation of contracts and certain recent price re-adjustments have revealed upon examination that there is an almost entire dissimilarity among the existing cost accounting methods. He therefore raised the immediate question: "Where do we go for a scientific and realistic basis for fixing costs and pricing?".

That there is a satisfactory answer to this question, the present writer knows: he has been a member of a group of men of diverse experience and wide-ranging talents, whose concerted and sustained efforts have established the data upon which to erect a rational system —a system which turns out to be so much in accord with what might be called the philosophy of production as to look to-day as if a totally new discovery of natural law operating in the industrial world had been made.

Nor is it generally known that these necessary groundwork studies in pricing have long been completed: a

small group of industrial engineers explored this situation very diligently for some fifteen years; and their findings, which were painstakingly analysed, tested, corrected and re-verified, brought them to definite conclusions, summarised by W. L. Churchill in his book on *Pricing for Profit*, which was published by The Macmillan Company in 1932. Like many prophets, Churchill and his colleagues were too far in advance of their time to make a dent in the prevailing conceptions of managerial responsibility, and even now it may be some years before the science of pricing is duly recognised and universally applied.

The Churchill formula is notably simple. According to Churchill, the price of any given article has two components: the cost of materials, and the service price. The cost of materials is considered separately because profit on the materials of which the article is made has already been collected by their supplier; thus the manufacturer is entitled to a profit only on the values which he adds to that material by manufacturing it into an article: the manufacturer's profit and these values, then, belong to the service price. Such an arrangement precludes the possibility of any pyramiding of profits.

The service price divides into its three elements: the cost of conversion, the cost of distribution and the cost of servicing. The research to which Churchill and his colleagues devoted those fifteen years disclosed that an exact formula-relationship exists among these elements.

Churchill defines the cost of conversion as that effort, or that energy, which must be put forth to produce a given article. It comprises such items of expense as the cost of labour, and all the overhead costs and expenses directly connected with the production phase of an enterprise. *The amount of this effort can be closely determined* by competent engineers. It is of importance that in this formula the calculation of these costs is based on normal utilisation of manufacturing-facilities and on proper compensation for all labour necessary in production. The category of labour is not merely confined to machine-operation but includes the work of the entire personnel, from the plant-manager to those performing the simplest tasks. The cost of each of these phases of labour is accurately ascertainable. Such evaluation should of course not admit into formular consideration any such subnormal or abnormal conditions affecting personnel and facilities as come within the purview of the manufacturer's control, for such an admittance would invite occasion for the manufacturer to pass the cost of his negligence on to the innocent consumer. This engineering and impartial approach to the determination of the most important of these elements of cost (labour and facilities) is very important, because it establishes a firm foundation for the eventual superstructure of price elements.

The cost of distribution Churchill defines as that effort which must be put forth in order to move the finished product to the point where it is readily available to the consumer. Here Churchill's further notable discovery in economics is that of a reliable method of predetermination. Authorities have never agreed upon how much expenditure to allow for distribution-costs. Churchill shows that this allowance must be based on normal and efficient effort only. Here again he disallows any deviation from normal operation, which the consumer would ultimately have to pay for.

The cost of servicing covers that margin of protection which insures the stability of the capital account and assures the continuity of the enterprise. This is yet another great contribution to economics: for the first time in the history of our industrial economics, this particular element of price has become accurately determinable. It turns out to be in direct proportion to the cost of conversion. Here again Churchill has introduced a truly scientific procedure, since cost of servicing is predictable from the cost of conversion.

Thus Churchill's system leaves no room for profiteering. Its concept of profit is totally different from the prevalent conception of profits, which is without natural definition. Profit, as defined in Churchill's system, permits the manufacturer to treat his capital account as a ratio, and provides for the reserves needed for maintaining a uniformity of operation. A certain percentage of it also provides for research, a department which has not yet been insisted upon as an indispensable adjunct to every industry; yet it is as indispensable for the industry's continuance as insurance for safety is.

Churchill insists that this provision for research shall not be a paper-percentage, but that actual expenditure upon competent and efficient research in new developments, designs and methods shall follow. Nor is research to be limited to production ends, but should include finding new and desirable ways of selling products, of bettering labour conditions and so forth.

The socially responsible content of Churchill's approach to pricing is apparent: for he traces a sufficient number of cases of insufficient profits or of losses to aberrations from this formula. Conversely, he explains the success of operations as due to observance of the balance which the formula exacts. Studies of operations within General Motors, Eastman Kodak, Procter & Gamble, Johns-Manville, Hershey Chocolate, Endicott-Johnson and other successful corporations, have offered ample witness to the correctness of the latter explanation.

There are no mysteries connected with the Churchill price-structure. There is no need to hide any fact behind a smoke-screen of technical jargon, for the socially proper amount of profit, which the system formulates, can be justified before any court of inquiry, whether it be conducted by government, by labour, by competitors or by any other agency which may be set up to guard the interests of the consumer or of society as a whole. Had Churchill's price-formula been in effect today, our current governmental price-regulation would not be as chaotic as it is, and the cost of enforcement of observance of our numerous price-ceilings would be considerably reduced. Prices could be justified and the way cleared for the consumer to understand and appreciate the values created by the producer. Ideally everyone of us is a producer as well as a consumer. What is fair for one should be fair for the other—that is the only principle by which a sound society can hope to exist.

A. P. de S.

THE NEW NATURALISM

An Abstract

THE PROPER STATE of a philosophic mind, in terms of contemporary opinion that the cosmos is itself a mind and not a machine, is examined by Dr. Paul Weiss in an article on *Cosmic Behaviourism* in the Philosophical Review, July 1942. Dr. Weiss, long-time professor of philosophy at Bryn Mawr College, is the author of *Reality* (Princeton University Press) and co-editor of six volumes of the Collected Works of Charles S. Peirce.

The present article is a condensed critique of the behaviour of the universe as a body-mind complex; and the author stresses the implication that the mind portion must be described in terms of its own, and not in terms borrowed from the physical partner. Contemporary philosophy of science, with new views of causality, though not up for discussion, is implicit in that which follows. Dr. Weiss, however, makes no reference to Asiatic philosophers by name. Counting them in, his minority would be the majority. We therefore take the liberty of interpolating an important word. "Almost all [European] writers are agreed . . . on the fact that there were no human minds before there were human bodies. The dissenting minority, however, . . . includes Democritus, Plato, Plotinus and their followers. All these hold that the mind is an eternal substance, or part of one, in no way dependent for its existence on the presence or action of material things. To make their point, however, they are forced to distinguish between the mind as a bearer of pure ideas and the mind as the domain of images, feelings, and sensed qualities." Dr. Weiss's reasoning turns on certain categorical passages, which (with his generous permission) we cite, together with an abstract of the supporting thought.

"*Mind arises neither inevitably nor by chance. It is the product of a natural process which is shot through with contingency and accident.*

"One who denies causation is bound to hold that nothing exists but a sequence of independent and correlevant occurrences, each one a miracle, impotent and inexplicable. For him no rational predication or explanation is possible, and he is forced to cancel out the evidence of daily experience and the intent of science and philosophy.

"The theory defeats itself. The more firmly one holds to it, the more surely one must affirm that its denial is equally reasonable. A theory which asserts that the past and future are completely independent must allow that the future may be entirely unlike the past.

"The theory of causation can be interpreted in one of three ways. One can suppose that causation is somewhat of a hit-or-miss affair, a propulsion which slips an occasional cog in the course of its occurrence, producing unpredictable novelties as well as inevitable consequences. This is the theory of indeterminacy, of which Heisenberg's is but a special instance. It involves a rejection of classical teleological views as well as of classical mechanistic ones. To accept it is to free oneself from the dogma that there is some distant, all-powerful fate which pulls all things irresistibly forward, and from the dogma that causation is nothing but another word for logical deduction.

"It is possible, however, to interpret the theory of causation in such a way as to preserve the principle of determinacy. But then it will be necessary to give up mechanism and accept in its place the classical theory of teleology. According to this interpretation, causation is the exhibition of an irresistible power. But it is a power which the future exerts on the present rather than one which the present exerts on the future.

"*The operations of the mind make a difference to the other activities in which a man may engage.*

"Mind has a rôle to play in nature. But it would be driving the point too far to affirm that the mind is nothing more than an instrument for the pursuit or use of things in nature. . . . The mind does not rule the body with an iron hand, nor does it constantly concern itself with practical problems. It is but one of the factors in an organic pattern of activities in which it is sometimes dominant, sometimes coördinate, and sometimes recessive.

"*The content, origin and functions of the mind can be adequately described and accounted for in behavioural terms alone.*

"This is the most important of the three propositions which define the new naturalism. It affirms that there is a significant sense in which the entire history, activity and content of the mind are public and observable. It does not compel one to affirm that the mind is a physical body, that thoughts are words, or that psychology is physiology. It does not deny that there are inferences, images, and ideas, or that these are characteristic of mind alone.

"To carry through the program of a living naturalism, we must criticize and modify our traditional approaches until they become broad and flexible enough to deal, at least in principle, with every kind of fact with which the mind makes it possible for us to deal. To do this, we cannot avoid using the mind. Theories . . . that the mind has such and such a nature are not mere words nor expressions of a tendency to solve a personal or social problem. They make a claim to truth, and depend on the fact that there are minds which entertain ideas, judge and infer — which is what no body can do. Though any truth about the mind has a behavioural expression, the mind remains a mind and not a form of physical behaviour. The fact that a portrait catches the essence of a man does not mean that the man thereby vanishes. I suppose there is no one to-day who would maintain with Watson that there are no minds and that thinking is nothing but subvocal talking.

"The individual does not provide sufficient data for an adequate account of the origin, content or functioning, of the mind. Our origins are outside us, our content refers beyond itself, and our activities take place in a cosmos and in the face of the acts of others. We must look outside the body as well as within, if we are to

provide a behaviouristic account of truth, meaning, intent, prediction, expectation, perception, and speculation.

"A behaviourism which takes itself seriously cannot content itself with an account of only some aspects of mind. . . . The more inward and private the phenomena, the wider the range of the data that must be brought into account. . . . If we seek definite, specific and experimentally determinable answers to our questions, we must confine the scope of our inquiry to those phases of the mind which require the use of but a limited set of data. From that beginning, experimentally controlled and constantly checked, we can pursue our inquiry further and further afield and thereby come closer and closer to an adequate account of the nature of the deeper recesses of the mind. How far we can go in this direction no one can antecedently determine. But, since we cannot empirically get all the data necessary for an explanation of the most private possible fact, we know that by experimental means alone we cannot answer all our questions. This, instead of being an occasion for despair, is really an occasion for cheer, for it points up the value of intuition and speculation. These take as their starting-point the very facts which are beyond experimental reach, and end at the point where behaviourism is in firm control. Intuition and behaviourism, speculation and experiment, are thus supplementary, and between them should be able to give us precise information regarding any fact.

"An adequate behaviourism is a cosmic behaviourism, just as an adequate physics is a cosmic physics, an adequate chemistry is a cosmic chemistry, and an adequate ethics is a cosmic ethics.

"Our studies of mind have too long been precopernican in spirit, limiting themselves to a study of individual selves, organisms, or local situations. We must face the fact that man and his mind are part of nature and there is no portion of nature which can be arbitrarily excluded as impertinent to him.

"A naturalist is one who holds that nature is self-sufficient, requiring neither support nor sustenance from without. He recognises no object or fact as beyond his capacity to understand through the extension of methods which have proved effective in the understanding of things. . . . Since it is knowledge that he seeks, and not the privilege of holding tenaciously to some other method, no matter how cumbersome or ineffective, he does not hesitate to abandon the behaviouristic approach, without giving up its claim to fall back on other methods when these promise to be more fruitful.

"These, too, he uses in such a way as to make manifest the fact that the mind is a natural phenomenon with a natural history, taking care to check what he thus discovers with the results other procedures have made possible. And when, as in the case of the determination of the nature of the felings and emotions, he finds it desirable to use both methods at once, he allows no traditional shibboleths to stand in his way."

RECENT ITEMS

Toward Economic Democracy

THERE IS ENCOURAGING EVIDENCE that industrialists are stirring to a new sense of their responsibilities to the nation. A wholly new note in industrial relations has been introduced by Mr. Arthur A. Hood, director of dealer relations for the Johns-Manville Corporation. That this great corporation, so securely established at the vertex of one of our fundamental industrial categories, is pressing for an enlightened policy gives room for hope that the sour exchanges which reciprocate between industrial groups and government, labour, and consumer groups will sweeten, for here industry has spoken in explicit socially meaningful terms: At a luncheon of the American Marketing Association last December Mr. Hood revealed that a Producers' Council of leading building-material manufacturers has established five special committees: technical, industrial and consumer relations, government relations, financial and marketing. "The industrial and consumer relations committee," said Mr. Hood, "will take up the question of labour relations. One of the aims of this committee is to find out what the consumer is thinking about the post-war period. Planning without representation will be just as unpopular in the post-war period as taxation without representation was in Colonial days."

In the first trying times of the war, Mr. Donald Nelson suggested to industry the inclusion of labour-representatives in shop-councils. This suggestion met with circumscribed response. But now, if our great corporations, among which Johns-Manville is preëminent, are actually ready to divest themselves of isolationism, we may indeed be on the way out of our economic difficulties, nationally and internationally. To-day, corporations have but a narrow range of policies to choose among. Formerly, it was not uncommonly the custom of a corporation first to act as if the industry in which it was engaged had no responsibility for the social consequences of its policies, and then to complain because the social pressure effected by its own isolationist practices recoiled upon it in the shape of restrictive governmental regulations. To be sure, such governmental pressure was exerted often clumsily, because legislators, rarely expert in corporate industry, usually resorted to what physicians call symptomatic treatment, which is what you employ when you really don't know what the patient has and have to do something until you find out later, when perhaps the patient is dead.

But suppose that a great corporation, bell-wether to many others in its field, were to say, as Mr. Hood in essence says: "Our business is the nation's business, and we are its stewards. Our job is to see that the best possible houses, convenient and durable, are built, for the least money, in places and forms of high minimum-standard

beauty. We are acting on behalf of others: not on our own behalf. We are Americans, and indeed, now world citizens. We can proceed only upon democratic concert, aiming for social results and not for profits first or largely." Then we have a wholly new situation. That situation implies the introduction, into every one of such new councils and into all great industrial corporations, of an educational department, just as necessarily as (and perhaps for better reasons than) to-day a corporation is equipped with a legal department—an educational department in the true sense of the word "educational"—in order that the corporation's personnel may have the necessary socio-economic knowledge, and the ethical endowment, to administer its trust. By such a policy the energies to-day constantly drained by conflict and waste can be converted to widely coöperative practice. It appears as if this war's lessons were coming home to us in terms of genuine adjustment, to be made where it will count. F.K.

A Christian Post-War World

MOREHOUSE-GORHAM COMPANY has issued in the United States the valuable discussion of the five propositions of the Pope, 1940, and the five economic standards affirmed by the Oxford World Conference, 1937. The contributors are Dr. William Temple, Archbishop of Canterbury, Dr. Herbert Williams, Bishop of Carlisle, A. E. Baker (a Canon of York), and eight other persons, who are Catholic, church critic, member of Parliament, don and otherwise distinguished and diverse in their lives and opinions. This volume is an essential for the educator, editor or social worker who desires to have before him the mature opinion of representatives and spokesmen of the greatest Christian groups. E.J.

A CHRISTIAN BASIS FOR THE POST-WAR WORLD, by the Archbishop of Canterbury and others, edited by A. E. Baker. Morehouse-Gorham Company, New York, 1942. 123 pages, paper cover, $1.

Religion Revives in Russia

HOW THE CURRENT RAPPROCHEMENT between the Russian Government and the Greek Catholic Church is progressing in Russia, is told by the Reverend Sergei Bolshakoff, in an article in The Living Church (February 21, 1943):

"The Stalinist constitution of 1936 declared equal rights and obligations for all Soviet citizens. By this declaration the clergy reäcquired its civil rights, which it had lost at the time of the Revolution. Gradually many more concessions followed: manuals of history ridiculing Russian Christianity were withdrawn from circulation, blasphemous plays and films were forbidden, and finally in June of 1940 Sunday was restored as a compulsory Holy Day.

"On the eve of the German invasion of Russia, the Orthodox Church there had not yet recovered from the wounds it had received during the fiery years of the Revolution. The Soviet War News on August 22, 1941 published statistics on the Russian Church: it possessed then 28 bishops, a decrease of 75% from the 1917 figure; it had 5,665 priests, a drop of some 90%; and 3,100 deacons, as against 15,210 before the Revolution. Still in use for religious purposes were 4,225 churches and 37 monasteries, as against 46,457 and 1,026 respectively in 1917. A careful study of different Soviet papers reveals approximately 60,000,000 Orthodox in the Union, scattered over some 20,000 religious associations. Then we find that the number of the faithful has been halved, with a loss of about one third of their parishes. Some districts are much deChristianised; others have suffered comparatively little.

"The Russo-German War has produced an indubitably strong growth of patriotism . . . and consequently a greater interest in and a greater respect for Russia's cultural past, which is . . . closely connected with the Church. The habit of looking upon the clergy as a group of despicable humbugs, exploiters of popular ignorance and supporters of capitalism is fast disappearing. The clergy, as well as churchmen, remained loyal to the régime. Among Soviet prelates the Germans were unable to find any support such as they found among the Ukrainian prelates of the Polish Orthodox Church.

"The Soviet State began gradually to take notice of the Church, its clergy and laity. Their requests began to get a hearing and were satisfied so far as possible. Their dual rôle as preservers of the nation's culture and as links with the past to secure the continuity of the national history was acknowledged. The appointment of Metropolitan Nicholas of Kiev as a member of the state commission to investigate German atrocities is a case in point. For the first time since the Soviet régime had come into existence, a churchman and prelate was appointed to sit on a state commission of the greatest representatives of Soviet culture and society." D.H.L.

Of Men and Atoms

BECAUSE THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE decided not to hold its annual meeting last December, Dr. Irving Langmuir, its president, chose to address his official discourse for this occasion, through the kindness of the Columbia Broadcasting System, to the general public. Such an event has set an encouraging precedent: Instead of suffering half-hourly invasions of the public privacy by radio's mongers in soap, cereals and sundries, interlarded with mechanised attention-holding devices, the homes of the American Nation will yet ring with the thoughts of its chief thinkers.

On this occasion, Dr. Langmuir traced the idea of causality from Ampère's assertion that "if he were given the positions and velocities of all the atoms in the universe it should be possible theoretically to determine the whole future history of the universe", through Planck's and Heisenberg's uncertainties, to "the net result of the modern principles of physics [which] has been to wipe out almost completely the dogma of causation" and to leave us with Probability for the behaviour of the individual atom. "If, however, we are dealing with large numbers of such atoms the behaviour of the whole group would be definitely de-

termined by the probability of the individual occurrence and therefore would appear to be governed by laws of cause & effect. Just as there are two types of physics, classical physics and quantum physics, which have for twenty-five years seemed irreconcilable, just so must we recognise two types of natural phenomena. First, those in which the behaviour of the system can be determined from the average behaviour of its component parts, and second, those in which a single discontinuous event (which may depend upon a single quantum charge) becomes magnified in its effect so that the behaviour of the whole aggregate does depend upon something that started from a small beginning. The first class of phenomena . . . [may be called] convergent phenomena, because all the fluctuating details of the individual atoms average out giving a result that converges to a definite state. The second class we may call divergent phenomena, where from a small beginning increasingly large effects are produced. In general, then, we may say that classical physics applies satisfactorily to convergent phenomena and that they conform well to the older ideas of cause & effect. The divergent phenomena, on the other hand, can best be understood on the basis of quantum-theory of modern physics. . . .

"The growth of any animal from a single cell is a typical illustration of a divergent phenomenon. The origin of species and all evolutionary processes involving as they do natural selection acting upon mutations must depend at almost every stage upon phenomena which originate in single atoms."

The rest of the discourse is based on the moot if familiar assumption that the unpredictables compound in accordance with probability to make up the dependable, or coherent, behaviour of aggregates. This age-old problem, for which no solution was offered on this occasion, will indeed be ready for clarification only after more metric work has been done in biology.

F.K.

Crystal Clues to Life Origins

Dr. Irving Langmuir, in his radio address of December 26, 1942, cited a most interesting example of relation of individuality (his divergent phenomena) to its complimentary companion (his convergent phenomena):

"Glycerine is commonly known as a viscous liquid, even at low temperatures. Yet if crystals are once formed they melt only at 64°F. If a minute crystal of this kind is introduced into pure glycerine at temperatures below 64° the entire liquid gradually solidifies. During a whole winter in Schenectady I left several small bottles of glycerine outdoors and I kept the lower ends of testtubes containing glycerine in liquid air for days but in no case did crystals form. My brother, A. C. Langmuir, visited a glycerine-refinery in Canada which had operated for many years without ever having any experience of crystalline glycerine. But suddenly one winter, without exceptionally low temperatures, the pipes carrying the glycerine from one piece of apparatus to another froze up. The whole plant and even the dust on the ground became contaminated with nuclei and although any part of the plant could be temporarily freed from crystals by heating above 64° it was found that whenever the temperature anywhere fell below 64° crystals would begin forming. The whole plant had to be shut down for months until outdoor temperatures rose above 64°. We have here an example of an inherently unpredictable divergent phenomenon which profoundly affected human lives."

We may come to know much more about the relation of divergent to convergent classes of events when we begin to examine crystallisation as a low-order biological phenomenon. Obviously in this area lies a mystery. With one crystal introduced into a mother liquor, a kind of crystal-reproduction starts up. But also, significantly enough, we know that in other cases mere supersaturation initiates the process. Herein we see the border between the dictum, "All life from life", and physical-science concepts. F.K.

A Permanent United-Nations

When Amos J. Peaslee was attached to the American Commission to Negotiate Peace at the Versailles Conference of February 1919, he submitted a proposal to incorporate a World Court in the League Constitution. This proposal is reprinted in a forthright little volume, devoted to what remains to-day the great world juridic problem: that of implementing a codified international law *before* a world police can fairly operate. Mr. Peaslee's persistently clear thinking illumines the little book throughout, to the relief of all readers wearied in the extreme with the "windy suspirations of expired breath" which befog the stark, simple issues of our times. By all means buy and in detail read it, and you will be a happier person. The footnotes in themselves form an admirable reading-list. E.J.

A Permanent United Nations, by Amos J. Peaslee. G. P. Putnam's Sons, New York, 1942, x+146 pages, $1.50.

Biological and Social Integration

In the eighth volume of Biological Symposia, *Levels of Integration in Biological and Social Systems*, published by the Jaques Cattell Press under the editorship of Robert Redfield, various specialists discuss: Transition from the unicellular to the multicellular individual; Intermediate levels of organismic integration; Higher levels of integration; Synergistic aspects of bacterial populations; Transition from the individual to the social level; Integration in infrasocial insect populations; Social dominance and subordination among vertebrates; Basic comparisons of human and insect societies; Societies of monkeys and apes; The societies of primitive man; Modern society.

A discussion of this timely and valuable reference-work will appear in an early issue: its mention, together with other books noticed, here will serve as a brief bibliography pertinent to sociometrics.

AFRICA: DEATH-SCENE OF IMPERIALISM

Timely Reference-Works

HISTORY HAS COME FULL ROUND. On the scene of Carthage, of Egypt, of Palestine, rage the battles which attend the settlement of those imperial struggles whose first theatres were in these same great valleys. This time, we permit ourselves to hope, it is imperialism itself which is to perish outmoded in fact as it is in principle. If it does not, we shall have lost the war—and Africa and the Near-East will again in due time be the scene of the same struggle for power over other peoples. With China free, and when India is free, Asia will be free. Only Africa will remain the seat of nearly ungoverned exploitation and of contests for profits.

Here France has possessions. Dr. Henri Barzun, in *The French Forum* (Christmas 1942 issue), tells us that "France as a colonial power has one important advantage in that almost at her very doors, within 35 hours of Paris, lies three-quarters of her empire with a native population of 43,000,000.

"In the colonial expansion which followed the discovery of America, France contributed her share, and the history of her efforts may be summed up in three periods. The first period reached its climax in 1750, when France was the most powerful colonising country in Europe, extending her possessions in North America over what was then known as New France, that is, Canada and Louisiana, from Hudson's Bay to New Orleans and through the Mississippi Valley. The second period covered about half a century from 1750 to 1815, when the decline of the French monarchy in an endless succession of wars, followed by the French Revolution and the Napoleonic Empire, dismantled the whole colonial dominion of France and let it fall into the hands of Great Britain. The third period began about 1815, continuing through monarchy and republic, up to 1920, during which time a new colonial empire to replace the lost one was built up and is now in full development.

"Instead of North America and India, Africa is now the most important field of French colonial development. Here the French possessions have an area of 4,500,000 square miles, that is, twenty times the size of France itself, and a coloured population equal to the number of France's white inhabitants. The French colonies in Africa, which exceed those of Great Britain by about one-fifth, suggest a kind of confederation, slowly built up by the gradual acquisition of 20 provinces from 1830 up to the Versailles Treaty. A beginning was made with the annexation in 1830 of Northern Algeria, to which were added the colonies of Gabon, Congo, Ubangi, and Chad in 1841; Guinea and the Ivory Coast in 1843; Somaliland in 1864; Tunis in 1881; Senegal in 1889; Sudan, Volta, Dahomey, and Mauritania in 1893; Madagascar and Réunion in 1896; Southern Algeria in 1902; Niger and Morocco in 1912, and the German Cameroon Mandate in 1919."

The French-owned area in Africa is only a little less than that controlled by Britain, but the population in the latter area is larger—52 as against 35 millions—and, compared to Britain's imperial profits and perquisites, those of France and Belgium are small potatoes. A. N. Cook has just issued a valuable detailed study of *British Enterprise in Nigeria*. Before quoting him, we must point out that the actual administration of the area by British commissioners and other officers may be fair and thoughtful, and the colony is not the scene of contests for the land between whites and coloured races, since Nigeria is climatically not very well suited to the European. The imperial problem here and in so many places in Africa is a part of world economic activity. The population is defenseless and inexperienced. Until the economic problems of the world are sanely reorganised, imperialism will go on, disguised, but nonetheless exploiting the worker.

"... The native producer is dependent upon European trading companies to market his goods. The great firm of Unilevers holds a monopoly of the trade of West Africa and, through the Niger Company (now a subsidiary), controls the trade of Nigeria. Rivalry has been eliminated, prices have been controlled, independent avenues of trade have been closed, efforts to form producers' coöperatives have been stifled, and exorbitant freight-rates have been charged. The spread of prices paid the producer in Africa and the prices received for the same product in Liverpool is considerable. A few examples will make this situation clear. In a typical year, 1930, the native producer was paid £29 16s per ton for cocoa while the price in Liverpool was £35 12s. In the same year the price of groundnuts in Lagos was £8 18s per ton as compared to £17 19s in Liverpool. Palm oil sold for £16 per ton at Lagos in 1930, but in Liverpool the price was £25 18s. This condition would appear to be quite unfair and doubtless it is, but again it should be kept in mind that it is not unique. The root of the difficulty would seem to be with the capitalistic system rather than with the particular policy employed in Nigeria."

Since Africa is the test for the sincerity of the world's conversion from imperialism (presuming India's freedom upon genuine terms, not those of the Cripps so-called mission) condensed and modern information about the continent is important. This is available in *The Atlantic Charter and Africa from an American Standpoint*, by the Committee on Africa, the War, and Peace Aims; and in *Events in African History*, by Edwin W. Smith, both issued by the Phelps-Stokes Fund, which has for many years specialised in Negro and African affairs. These two books are basic, brief, informative, exact. Mr. Smith's work is a careful tabulation of Africa's history from 4241 B.C., Institution of the Calendar in Egypt, to May 4, 1942, when the British occupied Madagascar. The ancient dates are only a sketch, to permit the bulk of the little volume to be given to what counts to-day. The other work contains authoritative, condensed data with a good coloured map of Africa, and provides a good view of its situation vis-à-vis peace proposals as of to-day. The low cost of the book is due to the aid of the Phelps-Stokes Fund. The possessor of the works cited below will have at hand all that he needs to enable him to see why the contest for African markets

is a great temptation, next after India, for Imperialism. For colour over the African scene he will do well to know: *Behind God's Back*, by Negley Farson; *West with the Sun*, by Beryl Markham; *The South Africans*, by Sarah Gertrude Millin; and *South of the Congo*, by Selwyn James. O.S.

THE ATLANTIC CHARTER AND AFRICA FROM AN AMERICAN STANDPOINT: A Study, by the Committee on Africa, the War, and Peace Aims; and a supplement: EVENTS IN AFRICAN HISTORY, compiled by Edwin W. Smith; published for the Committee by the Phelps-Stokes Fund, New York, 1942. xi+231 pages and a coloured map. Paper cover, $1.

BRITISH ENTERPRISE IN NIGERIA, by Arthur Norton Cook. Philadelphia: University of Pennsylvania Press; London: Humphrey Milford: Oxford University Press, 1943. ix+330 pages, $3.50.

SOCIETY UNDER ANALYSIS

BASIC BOOK

A VOLUME COMPACTLY WRITTEN by ranking authorities, each contributing to a comprehensive and well-ordered plan; which provides a starting-point behind which we need not look for any data of large importance; which brings all the pertinent sciences to bear on the central theme—such constitutes a basic book in the bibliography assembled in these pages. The editor of *Society Under Analysis*, Dr. Elmer Pendell, tells us that "this book had its inception in the conclusion that the time has come for a closer rapport between the physical sciences and the social sciences. In the fact that geographic and geologic phenomena, physical laws and chemical uniformities, heredity, and economic probabilities, as bases for human group behaviour have been neglected in most sociology classes we perceived an appropriateness in making available a text which would maintain a balance of attention to (1) relationships within the social structure and (2) relationships of that structure to the non-institutional factors that furnish the matrix for the structure. After a swift anthropological survey of the long past, as a means of establishing an orientation, we investigate the setting in which plural living develops, then proceed to analyse the basic elements of society, and next to show essentials of social organisation. . . . We claim no uniformity in our ethics. For example, if economic efficiency be inconsistent with freedom, there are some among us who would subtract much more from efficiency for the sake of freedom than would others among us. Some might insist that lack of efficiency could cost us the whole system which permits us any freedom. Others believe that if we yield up the freedom in striving for efficiency, the efficiency has no goal. But our ethics have been mostly left out, not only on this topic but on all others. We present merely the facts—though facts in their consequences and relationships. Let the reader, or the teacher, decide whether a force is to be resisted or fostered; the writers, for the most part, have not reported their opinions." That admirable program has been handsomely carried out: Anthropology comes first to give perspective, regularities are then laid down from the physical sciences (physics, chemistry, geography and geology), biology of plants and animals and the biology of our internal constitution, economics, and psychology. These are admirable preparation for Part III (The Elements of Society): Personality, Groups, Social Forces and Processes, Communication. By the time the reader comes to the chapters on Social Organisation itself (Part IV), he is equipped to judge and interpret them:

"Social Structure—Mostly Mind-stuff but All Real."

"The Family—A Guardian of the Social Heritage."

"Community—The World in Miniature."

"Religion and the Churches—Deep Places in Human Feeling."

"Organisation for Education—Shaping the Folkways of To-morrow."

"Organisation for Leisure—Time Out for What?"

"Economic Institutions—Complex Patterns of Action in Getting the World's Work Done."

"Organisation for Government—United We Stand."

"Poverty—A Challenge to Full Life Experience."

"Crime—Economics in Our Midst."

"Population—Have the Tenants of Earth Been Selected, or Have There Been Acres for All?"

"Social Control—Collectively We Rule; Individually We Are Bound."

"Leadership—One Step Beyond the Cultural Frontier."

"Evolution of Culture—From Simplicity to Complexity; Sometimes to Collapse."

Part V is devoted to Social Tensions, and Part VI to Social Change. In sum, *Society Under Analysis* is one of those books which reduce to relatively few pages a total of dependable knowledge derived from many sources, all of it required by us who live at a time which makes great syntheses mandatory. The authors, editor, and publishers of this volume are meeting the needs of the day in producing so comprehensive a source-book. The chapter bibliographies are especially satisfying. F.K.

SOCIETY UNDER ANALYSIS: An Introduction to Sociology, by Elmer Pendell, Ph.D., Editor, and 21 Coöperating Sociologists. The Jaques Cattell Press, Lancaster, Pennsylvania, 1942. viii+711 pages, $4.

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